CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

Staff Report for Item No. 7

Tentative Order No. R9-2004-0295

WASTE DISCHARGE REQUIREMENTS FOR THE PORT OF SAN DIEGO CAMPBELL SHIPYARD BAY SEDIMENT CAP CLOSURE AND POST CLOSURE MAINTENANCE SAN DIEGO BAY

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October 13, 2004

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1. INTRODUCTION

The site of the former Campbell Shipyards is located on the northeastern shore of San Diego Bay at 501 East Harbor Drive in the City of San Diego. The site was leased by Campbell Industries from the San Diego Unified Port District. Campbell Industries, former operator of Campbell Shipyards, was started by the Campbell Brothers in 1906. Campbell Industries began operation of Campbell Shipyards in 1926. Shipbuilding and repair operations at Campbell Shipyards historically encompassed a large number and variety of activities and industrial processes including, but not limited to, formation and assembly of steel hulls; application of paint systems; installation and repair of a large variety of mechanical, electrical, and hydraulic systems and equipment; repair of damaged vessels; removal and replacement of expended/failed paint systems; and provision of entire utility/support systems to ships (and crew) during repair. As a result of these processes, an assortment of wastes were generated. Currently, shipyard operations have ceased and existing structures have been removed and demolished.

2. BACKGROUND

Regulatory History. On May 24, 1995, the Regional Board Executive Officer issued Cleanup and Abatement Order (CAO) No. 95-21 to Campbell Industries and Marine Construction and Design Company Holdings, Inc establishing cleanup levels at the Campbell Shipyard for upland soils, groundwater, and offshore bay sediments adjacent to the Campbell Shipyard wharves and boat ways. CAO No. 95-21 required the clean up of contaminated bay sediments that have accumulated at the former Campbell Shipyard waterside leasehold in San Diego Bay over the years. Addenda Nos. 1 and 2 to CAO No. 95-21 established additional sampling requirements and cleanup levels. Addendum No. 3 was issued to add the Port of San Diego (Port) as a responsible party. On February 21, 2001, the Regional Board adopted Resolution No. 2001-45 rescinding Addendum No.3 to Order No. 95-21 as a result of the Port entering into an site remediation agreement with the Regional Board, in February 2001, wherein the Port agreed to conduct the cleanup. A revised Addendum No. 3 to CAO 95-21 was issued June 15, 2001, concerning soil and groundwater contamination at the former shipyard.

On February 21, 2000, the Regional Board adopted waste discharge requirement Order No. 2000-48, which established requirements for the Port to dredge and dispose of up to 30,000 cubic yards of sediment at the site of Campbell Industries. To the knowledge of the Regional Board staff, the discharger never completed the project described in Order No. 2000-48.

Selection of Remedial Alternative. On March 25, 2002, the Port submitted a report entitled “Interim Technical Memorandum Sediment Remediation Alternatives Evaluation Former Campbell Shipyard, San Diego, California”. The report described several remedial alternatives using technical effectiveness, implementability, environmental effects/habitat impacts, and estimated costs as evaluation criteria. The report selected capping in place as the preferred remedial alternative for contaminated sediments at the site.

On July 30, 2004, the Port submitted a report entitled "60% Basis of Design Report." The Regional Board accepted that submittals as the Report of Waste Discharge for the capping project. The report presented the basis of design for remedial actions at the former Campbell Shipyard. The original project consisted of the creation of an engineered cap and habitat cap, dredging, demolition, retrofitting, repair and reconstruction of 1,230 feet of existing seawall, placement of rock revetment in front of the existing seawall, potential construction of a 90-foot wave attenuation panel to protect the shallow sub tidal habitat area, and extension of a storm drain. The Port has since indicated to the Regional Board staff their desire to delete the wave attenuation panel and storm drain extension from the overall project.

Exemption - CCR Title 27. Normally, discharges of waste to land and/or the creation of waste management units for disposal/isolation of nonhazardous solid wastes are regulated pursuant to California Code of Regulations (CCR), Title 27. However, Section 20090 provides that remedial actions taken by public agencies are exempted from complying with the prescriptive requirements of CCR Title 27. Therefore, the proposed actions, to be conducted by the San Diego Unified Port District are exempted from prescriptive requirements of CCR Title 27, provided that the following conditions are met:

"…wastes, pollutants and contaminated materials removed from the immediate place of releases shall be discharged according to the SWRCB-promulgated sections of Article 2, Subchapter 2, Chapter 3, Subdivision 1 of this division (§ 20200 et seq.); and further provided that remedial actions intended to contain such wastes at the place of release shall implement the applicable SWRCB-promulgated provisions of this division to the extent feasible."

The applicable regulatory requirements for containment of wastes at the place of release are included within the Prohibitions, Specifications, Provisions, Monitoring and Reporting requirements of this Order. The applicable requirements include: specifications for the design and construction of the cap, obtaining acceptable financial assurances; and implementation of long term monitoring and maintenance for the engineered and habitat cap systems.

Threat to Water Quality and Complexity Ranking. The tentative Order has been revised to include a Threat to Water Quality (TTWQ) and Complexity (CPLX) ranking for the proposed de facto waste management unit to category "2-B." Under the current fee structure for Land Disposal, in CCR Title 23, Section 2200, the annual WDR fee would be approximately $9,800. The ranking this project was based upon the following rationale:

TTWQ Ranking - CCR Title23, Sec. 2200: Category "2" – Those discharges of waste that could impair the designated beneficial uses of the receiving water, cause short-term violations of water quality objectives, cause secondary drinking water standards to be violated, or cause a nuisance.

The cap system is designed to isolate residual waste constituents, containing environmental pollutants, from the surface waters and sensitive beneficial uses of San Diego Bay. The potential environmental pollutants include metals (copper, lead, zinc) and polychlorinated biphenyls (PCBs). Concentrations of waste constituents, including metals and PCBs, were determined to be above background concentrations in bay sediments, as detailed in the findings of Cleanup and Abatement Order No. 95-21 (available online at: http://www.swrcb.ca.gov/rwqcb9/misc/campbell_shipyard.html).

These metals and PCBs are classified as bioaccummulative constituents in CCR Title 22, Division 4.5, Article 11. As such, the long-term presence of these waste constituents in bay sediments poses a threat to existing designated beneficial uses of San Diego Bay by benthic aquatic organisms and a potential threat to the food chain via the process of bioaccumulation. The failure of the cap system could result in the release of environmental pollutants to a degree that may cause a short-term violation of water quality objectives and an exposure of benthic aquatic organisms thereby creating an impairment of designated beneficial uses in San Diego Bay.

Complexity Ranking - CCR Title 23, Sec. 2200: Category "B" – Any discharger not included above that has physical, chemical, or biological treatment systems (except for septic systems with subsurface disposal), or any Class II or Class III waste management units. The construction of a bay sediment cap constitutes a "physical treatment system" that is intended to permanently isolate the residual elevated concentrations of waste constituents in the bay sediments. The complexity of monitoring and underwater cap is comparable to the complexity of monitoring a closed Class II or Class III waste management unit. In addition, the potential failure of the physical treatment system (cap) could result in the release of environmental pollutants into the surface waters of San Diego Bay, causing violations indicated in Category 2 above.

3. DREDGING

Tentative Order R9-2004-0295 contains requirements to mitigate for potential discharge(s) of pollutants into San Diego Bay during dredging operations.

In order to construct the proposed cap, some areas will need to be dredged in order to maintain navigational depth requirements. Dredged sediment will be transported for disposal at an appropriately permitted upland landfill facility. The Port proposes to perform dredging using a mechanical clamshell bucket. To minimize turbidity outside of the project site, the Port proposes to use double silt curtains, comprised of a geotextile fabric supported by a floatation boom, surrounding the dredging area.

The method for dewatering dredge sediment includes sediment settling in the barge, decanting the supernatant water from the barge on-site with hoses behind the double silt curtains, addition of an appropriate amount of Type II Portland cement slurry to bind the free water in the sediment, re-handling at a designated stockpile area at the Tenth Avenue

Marine Terminal, and loading into trucks for transportation and disposal at the Otay Landfill. Decanting the supernatant water from the barge on-site with hoses may increase the turbidity of the receiving water, and a silt curtain is an effective method to minimize the turbidity plume of the returned water.

The dredging and disposal of dredged sediment as regulated by this Order is consistent with State Water Resources Control Board Resolution No. 68-16, Statement of Policy with Respect to Maintaining High Quality of Waters in California, and with the Water Quality Control Plan, San Diego Basin.

4. DISPOSAL OF CONTAMINATED SOILS

With the exception of approximately 1,000 cubic yards (cy), the sediment has been profiled as California non-hazardous waste and will be disposed of at one or more landfill(s) that are properly permitted under Federal and applicable State requirements. Approximately 1,000 cy of contaminated sediment from the shipways area, impacted by a limited extend of petroleum hydrocarbon free product and PCB, is presently being assessed and may be characterized as hazardous waste, which will be disposed of at a facility permitted to receive such waste.

5. CAP DESIGN/CONSTRUCTION

The Report of Waste Discharge includes consideration of the following factors in developing the design of the cap isolation of existing pollutants in bay sediments, potential short and long-term water quality impacts from consolidation of sediments, impacts from hydrodynamic factors (i.e., action by waves, tidal currents, propeller wash, bioturbation, geotechnical aspects (i.e., bearing capacity of sediments, settlement), and stability of the cap under forces generated by seismic events (i.e., liquefaction and spreading).

The cap system is comprised of two design elements:

A. Engineered cap: The largest area of the cap will be designed for permanent isolation of environmental pollutants in bay sediments. The engineered cap is comprised of a geotextile overlain by two feet of sand for isolation of pollutants in existing sediments; a layer comprised of one foot of well graded gravelly aggregate material to act as a filler layer between the overlying armor stone and the underlying sand, while also protecting against bioturbation, and a final layer of two feet of armoring stone to protect against erosive forces that may be imposed upon the cap. Additional foundation support, in selected areas overlying unconsolidated bay sediments at the edge of the cap, will be strengthened by construction of a “dumped rock foundation.”

B. Habitat cap: The habitat cap will be comprised of a 1-acre eelgrass habitat area. The design of the habitat cap includes a base layer of sand overlain by a geotextile layer, a one foot layer of well graded gravelly aggregate material to act as a protective layer for the geotextile, and a final layer of two feet of poorly-graded sediments with grains sizes ranging from medium to coarse sand to provide a suitable substrate for to support the overlying eelgrass habitat. The function of the geotextile is to help isolate any underlying residual environmental pollutants and protect against bioturbation into the underlying sediment.

As of October 1, 2004, the Port estimates that the construction of the cap system (i.e., with habitat cap and armored cap areas) will consume the following volumes of materials: 46,000 tons (engineered cap sand layer), 16,000 tons (sand habitat), gravel 33,000 tons (armored cap), armor rock (median diameter 1 foot) 60,000 tons, revetment rock and rock berm (21,000 tons) and 27,000 tons for dumped rock foundation (see Attachment 6 to this agenda item).

Other structural elements included in the original project, included a containment berm located at the toe of the Habitat Cap and a potential wave attenuation panel are proposed to protect and/or enhance the stability of the cap system. It is the understanding of the Regional Board staff that the Port has recently proposed to delete the wave attenuation panel from the project.

In August 2004, the Port reached agreement with BayKeeper and the Surfrider Foundation that the engineered cap would be constructed to provide effective and permanent isolation of environmental pollutants above the following concentrations in bay sediments:

Contaminant of Concern	**Concentration (mg/kg) Dry Weight**
Copper	264
Lead	88
Zinc	410
Total Polyaromatic Hydrocarbons (TPAHs)	3.47
Polychlorinated biphenyls (PCBs)	0.11
Total Petroleum Hydrocarbons (TPH)	<14
Tributyltin (TBT)	0.121

The sediment concentrations of the contaminants of concern (COCs) specified above are consistent with the required bay sediment cleanup levels established by Cleanup and Abatement Order No. 95-21 and addenda thereto. The concentrations listed above are also used as the "action levels" for evaluating results from sediment samples collected

from the cap system. A determination that sediment concentrations of COCs exceed the action levels will cause the Port to initiate an investigation of the cause(s) of the exceedance(s) and/or initiate corrective actions, if necessary.

Other Potential Sources of Pollutants. There is the potential for the introduction of pollutants from two urban runoff discharge points located in the vicinity of the former Campbell Shipyard: a 30-inch storm drain with an outfall to San Diego Bay, located north of the existing shipway and northwest of the habitat cap, and an urban stream (Switzer Creek) with an outfall to San Diego Bay located in front of the Tenth Avenue Marine Terminal (TAMT). Sediment samples collected from Switzer Creek contained significant concentrations of total petroleum hydrocarbons, lead, organochlorine pesticides, PCBs and polynuclear aromatic hydrocarbons (PAHs). Continued discharge of urban runoff and/or re-suspension of bay sediments that contain pollutants (e.g., from tug boat operations at the TAMT) could result in deposition of wastes on the engineered cap that may cause or threaten to cause conditions of pollution.

6. SLOPE STABILITY

The Port provided an analysis of the primary geotechnical and seismic concerns of the engineered cap including bearing capacity, seismic stability, and construction considerations. The engineered cap will be placed on top of unconsolidated and consolidated Bay Deposits. Stability analyses of the edge of the cap reportedly indicate the cap is stable with a minimum static factor of safety of 1.5.

The geotechnical report also indicates that in some areas, with the thickness of unconsolidated Bay Deposits are greater than 5 feet, the cap foundation will likely need to be strengthened by placing a rock foundation into the existing soft sediments. Conceptual stability analyses indicate that the potential of embankment failure may be mitigated by placement of a rock revetment fronting the embankment slope and/or by constructing a strong enough embankment. The Port has proposed an embankment extension consisting of an armor-rock revetment outerlayer over the engineered cap. In addition, the engineered cap is underlain by an engineered foundation (dumped rock) intended to strengthen the interface between the existing soil and proposed cap and armor-rock revetment. In order to mitigate for potential for displacement within the eelgrass habitat area, a rock containment berm will be constructed to provide lateral support and prohibit the lateral movement of the cap edges**.**

7. MONITORING REQUIREMENTS

Dredging Operations. During dredging operations, the Port shall submit estimates of the daily volume (in cubic yards) of dredge material and the location from which the material was removed. Visual observations shall also be made and recorded and submitted as part of the required reports.

The Port shall monitor and assess receiving water quality though the analysis of water samples collected from three sampling stations. Station A shall be located 500 feet

updrift of the dredging activities and outside any visual plume. Station B shall be located inside any visual plume at the dredging site and/or within the silt curtain if possible. Station C shall be located 500 feet downdrift of the dredging activities inside any visual plume if possible. At these stations, a Secchi Disc or turbidity meter shall be used each day during dredging activities to sample turbidity. If turbidity at Station C increases more than 20% over the turbidity at Station A, the dredging operations shall be suspended and appropriate measures taken, the Regional Board Executive Officer notified and remedial measures shall be implemented. Results from water quality monitoring shall be included in daily summary reports and compiled into the Final Construction Quality Assurance (CQA) Report referenced below.

Visual inspections shall be conducted following construction of the habitat cap to monitor re-colonization of eelgrass on the cap.

The Port must provide the Regional Board with a Final CQA Report of Testing, Reporting, and Certification. This report must include results from receiving water quality monitoring, evidence that there were an adequate number of results from analyses of test sample(s) of source materials imported for use as capping and habitat backfill materials. The final CQA Report is due within 120-days after the completion of cap construction.

Post-closure monitoring. Tentative Order R9-2004-0295 requires that the Port to propose a monitoring program for collecting and analyzing sediment samples from: beneath the armoring layer, from the chemical isolation layer (i.e., the 2-foot thick sand layer). The monitoring plan must also propose a monitoring program, including locations and frequency, for identification and sampling of sediments that accumulate upon the top of the armored layer of the engineered cap. Sediment samples must be collected from locations in the habitat cap using an aluminum core tube inserted into the surface of the cap.

The Report of Waste Discharge did not provide detailed information on the proposed monitoring and reporting program for the capping project or the long-term monitoring and maintenance. To obtain that information, tentative Order R9-2004-0295 requires the Port to provide the Regional Board with a Sampling and Analysis Plan (SAP) and a Quality Assurance Project Plan (QAPP) – see Attachment Nos. 1 (SAP outline) and 2 (QAPP outline) to Monitoring and Reporting Program R9-2004-0295. The SAP and QAP will contain the technical and procedural details and supporting rationale for the Port's monitoring and reporting plan for the proposed cap. The SAP and QAPP are to be provided to the Regional Board by December 31, 2004.

Visual inspections and sediment sampling shall be accomplished within 60 days of the completion of the engineered and habitat caps. The results of initial monitoring shall be reported to the Regional Board within 60 days after completing the visual monitoring. To ensure the caps maintain their integrity, the caps shall be monitored visually to ensure long-term integrity and identify areas that require periodic maintenance. All sampling

for annual monitoring shall be accomplished in March of each year in which monitoring is required following completion of the cap installation. Monitoring shall be conducted every year for the first seven years after cap construction. After the seventh year following construction, only visual inspections will be conducted annually. The full monitoring program shall again be completed ten, fifteen, and twenty years after cap construction. The monitoring program shall continue at five-year intervals beyond the twentieth year unless the Regional Board determines that a reduced monitoring program is appropriate or that monitoring is no longer necessary. A summary table of regular monitoring is provided below.

Regular Environmental Monitoring Matrix. The types of regular monitoring and monitoring/reporting frequency required by tentative Order R9-2004-0295 are summarized in the following table:

Year	2005	2006	2007	2008	2009	2010	2011	2012	2015	2020	2025
Years following construction	0	1	2	3	4	5	6	7	10	15	20
Visual Inspection	X	X	X	X	X	X	X	X	X	X	X
Sediment Sampling: **ANNUAL**			X	X	X		X	X			
Sediment Sampling: **QUARTERLY**	X	X				X			X	X	X
Biological Sampling		X		X		X		X	X	X	X
Habitat Restoration	X	X	X	X	X						
Compliance Statements	X	X	X	X	X	X	X	X	X	X	X

Contingency Monitoring Plan. These requirements go into effect if a potential breach in, or other damage to the cap system (in either the engineered or habitat areas) is identified:

(a) Sediment samples shall be collected and analyzed for COCs to determine the extent of any potential breach. The number of samples to be collected will depend on the extent of damage.

(b) The extent of damage shall be measured including area(s) and thickness of sand, gravel and/or armoring stone missing, and the area of exposed gravel.

(c) Biological tissue sampling shall be conducted in the area of the potential breach or other damage.

(d) If the surface of the cap system is found to contain COCs, above the Action Levels identified in Discharge Specification C.2(f) of Order R9-2004-0295, which do not appear to be from a breach in the cap, additional samples shall be collected and analyzed to determine the extent, and potentially identify the source. The discharger shall also collect and analyze sediment samples from the outfall of the existing 30-inch storm drain and the outfall from Switzer Creek (at the TAMT). The analytical results, supporting laboratory documentation, sample plot plan, a narrative interpretation of the results, conclusions and recommendations shall be provided to the Regional Board in the next monitoring report.

(e) Visual inspections shall be conducted within two weeks of a major earthquake, tsunami, or a storm event with winds of strong gale or higher (47 mph or higher); however, in certain cases of devastating disaster, the Regional Board Executive Officer may extend the two week requirement at his or her discretion. For purposes of this monitoring program, a. major earthquake is one that inflicts significant damage to property in the metropolitan San Diego area, and/or measures 5.5 or greater on the Richter scale within 30 miles of the San Diego Convention Center. A major tsunami is one that inflicts significant damage to property in San Diego Bay.

2. If biological tissue sampling indicates any species within the habitat cap contains COCs significantly above the levels of the same species at the reference site, then additional samples of the particular species shall be collected to determine the extent of potential recontamination, as well as to identify possible sources (inside or outside of the former Campbell Shipyard leasehold). Sediment samples shall also be collected in the area where the contaminated organisms were found and analyzed for COCs to further determine whether the source of the contaminants is the capped sediment.

Any potential breach in the cap system shall be reported to the Regional Board by telephone, by voice mail, or by fax within 24 hours from the time that 1) the discharger has knowledge of the potential breach, 2) notification is possible, and 3) notification can be provided without substantially impeding cleanup or other emergency measures. Any corrective action taken and/or repair done to the cap shall be reported in writing to the Regional Board Executive Officer within 30 days of when the discharger becomes aware of damage to or a potential breach in the cap. Subsequent written reports shall be submitted monthly in accordance with the following schedule until the damage or potential breach has been repaired or otherwise resolved.

8. FINANCIAL ASSURANCES

Tentative Order R9-2004-0295 contains Finding Nos. 18 and 19 addressing the need to provide adequate financial assurances to cover the costs of closure, post-closure maintenance, and corrective actions for a reasonably foreseeable release from the waste management unit. Those findings are as follows:

Finding 18: Implementation of cleanup and abatement actions, including installation of an appropriate cap to isolate sediments containing residual shipyard waste, will cost approximately $15,778,000; the Port has included approximately $15,778,000 for this purpose in its capital improvement budget for FY 2003-2007 as approved by the Board of Port Commission by Resolution No. 2003-71. This provides satisfactory assurance that the Port will be able bear the financial responsibility for closure.

Finding 19: Post-closure maintenance and monitoring at the *de facto* waste management/ residual waste containment cell will cost approximately $18,700 per year; shipyard waste will continue to present a threat to water quality indefinitely; the present value of indefinite post-closure maintenance and monitoring amounts to $561,000; in addition, it may cost up to $500,000 to ensure cleanup and abatement for reasonably foreseeable circumstances that cause or threaten to cause discharges of waste from the containment cell to waters of the state in San Diego Bay in a manner that might cause or threaten to cause conditions of pollution or nuisance.

In addition, Provision E.11 of the tentative Order requires:

Port shall provide assurances of financial responsibility for post- closure maintenance and monitoring in an amount of not less than $18,700 per year indefinitely, or for as long as the waste in the containment cell poses a threat of pollution or nuisance to waters of the state.

Port shall provide assurances of financial responsibility for reasonably foreseeable cleanup and abatement associated with the containment cell in an amount of not less than $500,000.

9. STAFF RECOMMENDATIONS

The Regional Board staff recommends adoption of tentative Order R9-2004-0295 and Monitoring and Reporting Program No. R9-2004-0295.